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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/454,766	12/03/1999	Guy Meynants	IMEC188.001A	4214

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EXAMINER

WU, DOROTHY

ART UNIT	PAPER NUMBER
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2697

DATE MAILED: 09/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/454,766

Applicant(s)

MEYNANTS ET AL.

Examiner

Dorothy Wu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☒ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4. 6) ☐ Other: \_\_\_\_

## DETAILED ACTION

### *Claim Objections*

1. Claim 3 is objected to because of the following informalities: The claim recites the limitation of "Red, Green, an Blue" in line 16. Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, the claim recites the limitation of "a method for determining at least two types of corrected aspect values for an aspect of a pixel" on lines 2-3, but recites the final limitation as "determining at least two types of corrected subaspect values for said pixel" on line 11. It is unclear whether the determination of subaspect values completely fulfills the method's objective of determining aspect values. All dependent claims are subsequently rejected.

Regarding claim 1, the claim recites the limitation "analyzing the measured intensity value in said first corrected intensity value." However, the claim also recites the steps of measuring an intensity value and calculating a corrected intensity value, indicating that the two values are distinct. It is unclear what is meant by a measured intensity value "in" said first corrected intensity value.

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Regarding claim 3, the claim recites the limitation “said types of corrected values for said colour are the Red, Green, and Blue corrected color values for said pixel.” There is insufficient antecedent basis for the limitation.

Regarding claim 5, the claim recites the limitation “analyzing the measured intensity value in said first corrected intensity value.” See reasoning for claim 1.

Regarding claim 9, the claim recites the limitation “analyzing the measured intensity value of said aspect of said pixel in said first corrected intensity value.” See reasoning for claim 1.

Regarding claim 9, the claim recites the limitation “calculated with the subaspect values of the same type of said set of pixels, the subaspect value obtained by....”

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claim 12 is rejected under 35 U.S.C. 102(e) as being anticipated by Kawamura et al, U.S. Patent 6,563,537.

Regarding claim 12, Kawamura et al teaches a method for determining at least two corrected color values for a pixel (col. 5, lines 32-25), said pixel being embedded in a configuration of pixels and having a color filter for filtering substantially one color type while obtaining a measurement on the pixel (col. 5, lines 18-19; Fig. 2), said method comprising the steps of: measuring at least one signal on said pixel (col. 5, lines 23-24); transforming the measured signal into a representation having at least a luminance and a chrominance part (col. 14, lines 31-42); and transforming said representation into a color space representation of said pixel, said pixel having at least two color values in said color space representation (col. 15, lines 11-12, 43-44).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-4, 7, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawamura et al, U.S. Patent 6,563,537, in view of Addison, U.S. Patent 5,990,950.

As best understood from the language of the claim, regarding claim 1, Kawamura teaches a method for determining at least two types of corrected subaspect values for an aspect of a pixel (col. 5, lines 33-36), said pixel being embedded in a configuration of pixels (Fig. 2), said method comprising the steps of: measuring at least one intensity value corresponding to said aspect for essentially each of the pixels in said configuration of pixels (col. 5, lines 32-33); calculating a first corrected intensity for said pixel (col. 5, lines 52-59; col. 6, lines 5-12, 28-29); analyzing the first corrected intensity value and a subaspect value (col. 14, lines 43-48); and thereafter determining at least two types of corrected subaspect values for said pixel (col. 14, lines 62-64). Kawamura does not teach that the first corrected intensity is calculated by combining the measured intensity values of a set of pixels out of said configuration of pixels. Addison teaches that the first corrected intensity is calculated by combining the measured intensity values of a set of pixels out of said configuration of pixels (col. 6, lines 20-23; col. 7, lines 27-30). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the method of correcting subaspect values by combining chrominance values taught by Kawamura with the method of calculating a corrected intensity value by combining the measured

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intensity values of a set of pixels taught by Addison to make an image processing method that uses intensities of neighboring pixels, regardless of color, to correct intensity but uses intensities of only neighboring pixels of the same subaspect to correct subaspect values. One of ordinary skill would have been motivated to make such a modification to preserve the sensitive variations in luminance while calculating missing chrominance values.

Regarding claim 2, Addison teaches that the aspect is the color of a pixel and the subaspect is the chrominance (col. 1, lines 53-55; col. 7, lines 59-62; col. 8, lines 34-37).

Regarding claim 3, Addison teaches that the colors and chrominances are red, green, and blue (col. 4, lines 46-47).

Regarding claim 4, Addison teaches that said pixel has a color filter for filtering substantially one color type while measuring said intensity value (col. 1, lines 31-41).

Regarding claim 7, Addison teaches that said set of pixels used for determining a corrected intensity value and said set of pixels for determining at least two corrected subaspect values consist of pixels in the immediate neighborhood of said pixel (Figs. 4-6; col. 6, lines 38-44, 57-64; col. 7, lines 1-3, 35-51; col. 8, lines 12-17, 51-56; col. 9, lines 7-11).

Regarding claim 11, Addison teaches that calculation of a first corrected intensity value for said pixel is performed by combining the intensities of a group of neighboring pixels, which reads on a low-pass filter (col. 6, lines 58-64; col. 7, lines 42-50).

5. Claims 8, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawamura, US. Patent 6,563,537, in view of Addison, U.S. Patent 5,990,950, and further in view of Juenger et al, U.S. Patent 5,778,106.

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Regarding claim 8, Kawamura in view of Addison teach the method according to claim 1. See above. Kawamura in view of Addison do not teach that the corrected subaspect values are determined using a median operator. Juenger et al teach that the corrected subaspect (chrominance) values are determined using a median operator (col. 8, lines 29-38). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the method of generating corrected intensity values taught by Kawamura in view of Addison with the practice of using a median operator to calculate a corrected subaspect value taught by Juenger et al to make an image processing method that corrects chrominances using median filters. One of ordinary skill would have been motivated to make such a modification to remove color aberration from an image.

Regarding claim 9, Addison teaches a color filter for filtering substantially one color type while measuring said intensity value (col. 1, lines 31-41). Kawamura teaches that R and B signals may be interpolated after the G signal is interpolated in order to improve the interpolation precision of R and B signals (col. 6, lines 23-25). Kawamura teaches that subaspect values (Cr, Cb) are obtained by analyzing the first corrected intensity value (G) and a subaspect value (R, B) (col. 14, lines 47, 49). Kawamura teaches that the corrected subaspect values are calculated using subaspect values of the same type (col. 14, lines 62-64; col. 15, lines 43-44).

Regarding claim 10, Kawamura teaches the step of selecting said set of pixels for determining the corrected subaspect values within the immediate neighborhood of pixels, selecting a subset of aspect values out of said set, subaspect values being of one type, and combining and averaging the subaspect values to determined the corrected subaspect values (col. 14, line 50-col. 15, line 4; Figs. 16A-C). Addison teaches that one subset of values is used when



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the variance of the values is below a predetermined threshold, and another is used when the variance is above the predetermined threshold (col. 7, lines 20-24).

6. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawamura, US. Patent 6,563,537, in view of Addison, U.S. Patent 5,990,950, and further in view of Kasson, U.S. Patent 5,793,885.

Regarding claim 13, Kawamura in view of Addison teach the method recited in claim 1. See above. Kawamura in view of Addison do not teach an electronic system implementing a method in hardware. Kasson teaches an application-specific integrated circuit for implementing a method in hardware (col. 5, lines 14-17). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the method of Addison with the practice of implementing techniques in hardware taught by Kasson to make a hardware apparatus that implements the method of Addison. One of ordinary skill would have been motivated to make such a modification to utilize the faster processing times of hardware over software.

7. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawamura, US. Patent 6,563,537, in view of Addison, U.S. Patent 5,990,950, in view of Kasson, U.S. Patent 5,793,885, and further in view of Prentice et al, U.S. Pub. No. 2003/0030729.

Regarding claim 14, Kawamura in view of Addison in view of Kasson teach the system according to claim 13. See above. Addison teaches a configuration of pixels of an image sensor and a color filter interpolation technique, each pixel having a color filter for filtering

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substantially one color type. See claim 1. As Addison teaches a solid state image sensing apparatus, it would have been obvious to integrate units implementing the method on a silicon chip. Kawamura in view of Addison in view of Kasson do not teach a finite-impulse response filter having a delay line for storing pixels in the immediate neighborhood. Prentice et al does teach a finite-impulse response filter operating on pixels in the immediate neighborhood [0010, 0037.] It would have been obvious to have a delay line to store pixels. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to integrate the units implementing the method of Kawamura in view of Addison in view of Kasson on a silicon chip and add the FIR filter of Prentice et al. One of ordinary skill would have been motivated to make such a modification to further improve the chrominance of the image.

### *Allowable Subject Matter*

Claims 5 and 6 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. The prior art does not teach the determination of a second corrected intensity value by combining said first corrected intensity value with the corrected subaspect value, nor the subsequent step of determining at least two types of corrected aspect values by combining said second corrected intensity value with two types of corrected subaspect values.

### *Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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Reitmeier et al, U.S. Patent 4,597,007, teach the generation of chrominance signals by subtracting corrected luminance signals from the composite video signal.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dorothy Wu whose telephone number is 703-305-8412. The examiner can normally be reached on Monday-Friday, 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Christensen can be reached on 703-308-7644.

Any response to this action should be mailed to:

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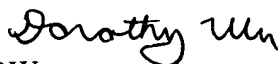
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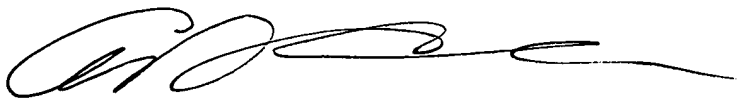
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Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703)306-0377.

  
DW  
August 20, 2003

  
ANDREW CHRISTENSEN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600